

# Statistical Evidence on the Deterrent Effect of Capital Punishment

## *Editors' Introduction*

Sophisticated statistical evidence became important in the litigation over the constitutionality of the death penalty a decade ago. As part of its attack on capital punishment, the NAACP Legal Defense and Educational Fund sponsored a statistical study of racial discrimination in the sentences imposed for rape in the South.<sup>1</sup> Abolitionist lawyers have relied on evidence of discriminatory imposition of the penalty to argue that it violated the Fourteenth Amendment's guarantee of the equal protection of the laws and the Eighth Amendment's prohibition of cruel and unusual punishments.<sup>2</sup> Such evidence clearly influenced the decision in *Furman v. Georgia*, in which the Supreme Court, by a five-to-four margin, struck down as cruel and unusual punishment the imposition of the penalty at the discretion of the judge or jury.<sup>3</sup>

A more fundamental statistical attack was directed at one of the underlying legislative rationales for capital punishment—that it is a more effective deterrent to crime than life imprisonment. This attack goes to the very existence of the penalty rather than the manner in which it is imposed. The issue of deterrence received some attention in *Furman*, and is now before the Court in *Fowler v. North Carolina*,<sup>4</sup> which poses Eighth and Four-

1. The findings of this study are reported in Wolfgang, *Racial Discrimination in the Death Sentence for Rape*, in W. BOWERS, EXECUTIONS IN AMERICA 114-20 (1974). This study confirmed evidence of the discriminatory imposition of the penalty reported in earlier investigations. See W. BOWERS, *supra* at 18-19.

2. Brief for NAACP *et al.* as Amici Curiae at 13-22, *Aikens v. California*, 406 U.S. 813 (1972) (Eighth and Fourteenth Amendment challenges dismissed as moot after decision of California supreme court in *People v. Anderson*, 6 Cal. 3d 628, 493 P.2d 880, 100 Cal. Rptr. 152 (1972), that capital punishment violated the state constitution); *Maxwell v. Bishop*, 398 F.2d 138, 141-48 (8th Cir. 1968), *rev'd on other grounds*, 398 U.S. 262 (1970) (after thorough discussion, then Circuit Judge Blackmun rejected a Fourteenth Amendment challenge, based on the NAACP study of racial discrimination in rape sentencing, note 1 *supra*, to a death sentence imposed under an Arkansas rape statute); Brief for NAACP Legal Defense & Educational Fund, Inc. and National Office for the Rights of the Indigent as Amici Curiae at 51-55, *Boykin v. Alabama*, 395 U.S. 238 (1969) (Eighth Amendment challenge based in part on statistical evidence of racial discrimination in imposition of death penalty).

The prohibition of cruel and unusual punishments is applicable to the states through the Fourteenth Amendment. See *Robinson v. California*, 370 U.S. 660, 667 (1972).

3. 408 U.S. 238 (1972). Two of the five Justices who concurred in the judgment of the Court relied at least in part on statistical evidence of the racially discriminatory imposition of the penalty. *Id.* at 250 n.15 (Douglas, J., concurring), 364-65 (Marshall, J., concurring). Two of the dissenters recognized the importance of the evidence for a possible claim of denial of equal protection of the laws. *Id.* at 389-90 n.12 (Burger, C.J., dissenting) ("data of more recent vintage" essential for equal protection claim), 449-50 (Powell, J., dissenting). See White, *The Role of the Social Sciences in Determining the Constitutionality of Capital Punishment*, 13 DUQ. L. REV. 279, 281-85 (1974).

4. *State v. Fowler*, 285 N.C. 90, 203 S.E.2d 803, *cert. granted sub nom. Fowler v. North Carolina*, 419 U.S. 963 (1974), *argued*, 43 U.S.L.W. 3582 (U.S. Apr. 21, 1975), *restored for reargument*, 422 U.S. 1039 (1975). See notes 17-18 *infra*.

## Statistical Evidence on the Deterrent Effect of Capital Punishment

teenth Amendment challenges to capital punishment imposed under North Carolina's mandatory sentencing procedure.

Of the nine Justices writing separate opinions in *Furman*, Justice Marshall, who along with Justice Brennan would have found the penalty unconstitutional per se, gave the most weight to the statistical evidence on deterrence.<sup>5</sup> From prior cases construing the Eighth Amendment, he derived the principle that a punishment is cruel and unusual if it is "excessive and serves no valid legislative purpose."<sup>6</sup> Devoting more than half of his discussion of the purposes conceivably served by capital punishment to the "hotly contested issue . . . whether it is better than life imprisonment as a deterrent to crime,"<sup>7</sup> he stated that the deterrent effect of capital punishment rested on "logical hypotheses devoid of evidentiary support," and invoked the statistical studies of Thorsten Sellin, which for him "demonstrate that there is no correlation between the murder rate and the presence or absence of the capital sanction."<sup>8</sup> He quoted extensively from Sellin as "one of the leading authorities on capital punishment" and included as appendixes to his opinion several of Sellin's tables comparing homicide rates in neighboring abolitionist and retentionist jurisdictions.<sup>9</sup> After considering and rejecting other possible purposes for capital punishment, he concluded:

[T]he death penalty is an excessive and unnecessary punishment that violates the Eighth Amendment. The statistical evidence is not convincing beyond all doubt, but it is persuasive. . . . [T]here is sufficient evidence available so that judges can determine, not whether the legislature acted wisely, but whether it had any rational basis whatsoever for acting. We have this evidence before us now. There is no rational basis for concluding that capital punishment is not excessive. It therefore violates the Eighth Amendment.<sup>10</sup>

The "excessive and unnecessary" standard of the Eighth Amendment is essentially equivalent to a substantive due process standard: the penalty is unconstitutional if it lacks a rational basis.<sup>11</sup> This due process analysis

5. 408 U.S. at 345-54 (Marshall, J., concurring). Justice Brennan stated that "the available evidence uniformly indicates, although it does not conclusively prove, that the threat of death has no greater deterrent effect than the threat of imprisonment." *Id.* at 301. Justice Stewart found the statistical evidence on deterrence "inconclusive." *Id.* at 307-08 & n.7. Chief Justice Burger characterized the evidence on deterrence as an "empirical stalemate." *Id.* at 395. Justice Powell observed that statistical studies "tend to support the view that the death penalty has not been proved to be a superior deterrent," but do not approach the showing required to find the penalty unconstitutional. *Id.* at 454, 456. See White, *supra* note 3, at 285-88.

6. 408 U.S. at 331. This principle was also put forth by Justice Brennan, *id.* at 279-80, but was sharply attacked by the dissenters, *id.* at 391-96 (Burger, C.J., dissenting), 451 (Powell, J., dissenting).

The other ground relied on by Justices Brennan and Marshall was that the penalty was "morally unacceptable to the people of the United States . . ." *Id.* at 360 (Marshall, J., concurring); see *id.* at 295-300 (Brennan, J., concurring).

7. *Id.* at 345-54.

8. *Id.* at 347, 350.

9. *Id.* at 348-50, 373-74.

10. *Id.* at 358-59 (footnote omitted).

11. The principle that a punishment is cruel and unusual if it is excessively severe was suggested by Justice Goldberg's dissent from the denial of certiorari in *Rudolph v.*

requires that those challenging the death penalty overcome the "presumption of constitutionality accorded legislative acts."<sup>12</sup> Whereas in a traditional Brandeis brief<sup>13</sup> statistical evidence is used to support that presumption, in *Furman* the evidence was used to attack it.

If the Eighth Amendment does prohibit unnecessarily severe punishments, the findings of Professor Isaac Ehrlich on the deterrent effect of capital punishment, reported a year after *Furman* and published this spring,<sup>14</sup>

Alabama, 375 U.S. 889 (1963), and analyzed as a substantive due process standard in Packer, *Making the Punishment Fit the Crime*, 77 HARV. L. REV. 1071 (1964). Justice Marshall recognized that his excessive severity principle under the Eighth Amendment "parallels in some ways" a substantive due process analysis:

The concepts of cruel and unusual punishment and substantive due process become so close as to merge when the substantive due process argument is stated in the following manner: because capital punishment deprives an individual of a fundamental right (*i.e.*, the right to life), . . . the State needs a compelling interest to justify it. . . . Thus stated, the substantive due process argument reiterates what is essentially the primary purpose of the Cruel and Unusual Punishments Clause of the Eighth Amendment—*i.e.*, punishment may not be more severe than is necessary to serve the legitimate interests of the State.

408 U.S. at 359-60 n.141 (Marshall, J., concurring).

12. 408 U.S. at 359 (Marshall, J., concurring).

Justice Marshall did not make entirely clear his view of the strength of the presumption of constitutionality accorded to the legislative enactment of capital punishment. On the one hand, he stated that those challenging the penalty "bear a heavy burden of demonstrating that it is excessive," *id.* at 360 n.141, and on the other, that

[d]espite the fact that abolitionists have not proved non-deterrence beyond a reasonable doubt, they have succeeded in showing by clear and convincing evidence that capital punishment is not necessary as a deterrent . . . .

*Id.* at 353.

In recent decades the Court has accorded a greater presumption to legislation restricting economic liberty than to that restricting noneconomic rights. Compare *Ferguson v. Skrupa*, 372 U.S. 726 (1963), *Williamson v. Lee Optical Co.*, 348 U.S. 483 (1955), *Lincoln Fed. Labor Union v. Northwestern Iron & Metal Co.*, 335 U.S. 525 (1949), and *G. GUNTHER, CASES AND MATERIALS ON CONSTITUTIONAL LAW* 576-96 (9th ed. 1975) with *Roe v. Wade*, 410 U.S. 113 (1973), *Griswold v. Connecticut*, 381 U.S. 479 (1965), and *G. GUNTHER, supra* at 616-56. Following this double standard, the Court would apply the greater scrutiny to punishments tested for a rational basis under the Eighth Amendment. Cf. Comment, *The Death Penalty Cases*, 56 CAL. L. REV. 1268, 1271-73 (1968). It has been suggested that the double standard may be justified by a theory of judicial review which accords greater deference to legislation supported by instrumental policy considerations—reasons of social utility—than to legislation supported by moral judgments. Wellington, *Common Law Rules and Constitutional Double Standards: Some Notes on Adjudication*, 83 YALE L.J. 222 (1973). Under this analysis, the legislative purpose of deterrence for capital punishment might be subjected to less scrutiny than the other purpose most often advanced—retribution. For discussions of retribution as a justification for capital punishment, see, *e.g.*, *Furman v. Georgia*, 408 U.S. 238, 303-04 (Brennan, J., concurring), 308 (Stewart, J., concurring), 342-45 (Marshall, J., concurring), 394-95 (Burger, C.J., dissenting), 452-54 (Powell, J., dissenting) (1972); Packer, *supra* note 11, at 1078; Comment, *supra* at 1297-1301.

13. Before he was appointed to the Court, Louis Brandeis submitted a brief supplying extensive factual support from nonjudicial sources for an Oregon law regulating hours of work for women. His brief received favorable comment in Justice Brewer's opinion for the Court upholding the statute, *Muller v. Oregon*, 208 U.S. 412, 419-20 & n.1 (1908), and has become a classic example of the use of social science data in constitutional litigation. See P. FREUND, ON UNDERSTANDING THE SUPREME COURT 86-92 (1949).

14. I. Ehrlich, *The Deterrent Effect of Capital Punishment: A Question of Life or Death*, 1973 (Working Paper No. 18, Center for Economic Analysis of Human Behavior and Social Institutions); Ehrlich, *The Deterrent Effect of Capital Punishment: A Question of Life or Death*, 65 AM. ECON. REV. 397 (1975) [hereinafter cited as Ehrlich 1975].

## Statistical Evidence on the Deterrent Effect of Capital Punishment

bear importantly on the question now before the Court in *Fowler*. One of the two Justices who have thus far revealed themselves willing to declare the penalty unconstitutional per se has relied in large part on the statistical research of Sellin and others who have followed his approach. Ehrlich criticized the methods used by Sellin—graphical comparisons of homicide rates in neighboring states—and used a more sophisticated technique—multiple regression analysis.<sup>15</sup> He found a significant deterrent effect associated with the use of the death penalty in the United States over the period from 1935 to 1969, specifically that on average for the period studied each additional execution per year resulted in seven or eight fewer murders.<sup>16</sup> The Solicitor General of the United States, in his amicus brief in *Fowler*, called attention to the Ehrlich study as important empirical evidence that capital punishment serves the legitimate legislative purpose of deterring murder;<sup>17</sup> the petitioner, in his reply brief, sharply attacked

15. Multiple regression is a statistical technique for analyzing the relationship between a dependent variable, whose behavior is to be explained, and a set of independent or explanatory variables. The analysis uses a sample of data to estimate an equation in which the dependent variable is set equal to a weighted sum of the explanatory variables. The weights or "coefficients" associated with the explanatory variables are chosen to minimize the sum of the squared differences between the actual values of the dependent variable and the values computed using the regression equation (hence the term "least squares regression"). A graphical representation of a regression equation with only one explanatory variable would be a "least squares" line drawn through the scatter of points generated by plotting the dependent variable on the vertical axis and the explanatory variable on the horizontal axis. Econometrics is concerned with the use of regression analysis to measure and test economic relationships. See R. WONNACOTT & T. WONNACOTT, *ECONOMETRICS* 1-9 (1970); Finkelstein, *Regression Models in Administrative Proceedings*, 86 HARV. L. REV. 1442, 1444-55 (1973) [hereinafter cited as *Regression Models*].

Regression analysis is being used with increasing frequency in legal commentary. See, e.g., Branfman, Cohen & Trubek, *Measuring the Invisible Wall: Land Use Controls and the Residential Patterns of the Poor*, 82 YALE L.J. 483 (1973); Breyer & MacAvoy, *The Natural Gas Shortage and the Regulation of Natural Gas Producers*, 86 HARV. L. REV. 941 (1973); Finkelstein, *A Statistical Analysis of Guilty Plea Practices in the Federal Courts*, 89 HARV. L. REV. 293 (1975); Hirsch, Hirsch & Margolis, *Regression Analysis of the Effects of Habitability Laws Upon Rent: An Empirical Observation on the Ackerman-Komesar Debate*, 63 CAL. L. REV. 1098 (1975); Note, *Beyond the Prima Facie Case in Employment Discrimination Law: Statistical Proof and Rebuttal*, 89 HARV. L. REV. 387 (1975). However there has been little discussion in legal journals of the wide range of results which regression studies of a given relationship may produce and the statistical controversies which often arise between authors of these conflicting studies. But see *Regression Models*, supra at 1455-75; Levin, *Education, Life Chances, and the Courts: The Role of Social Science Evidence*, 39 LAW & CONTEMP. PROB. 217, 228 (1975) (conflicting statistical evidence on effects of racial integration and compensatory education programs on test scores of minority students). The economic literature reveals the extent of the disagreements provoked by econometric studies even of relationships on which there is considerable theoretical agreement among economists. See, e.g., D. PATINKIN, MONEY, INTEREST, AND PRICES 651-64 (2d ed. 1965); Jorgenson, *Econometric Studies of Investment Behavior: A Survey*, 9 J. ECON. LIT. 1111 (1971); Liviatan, *Tests of the Permanent-Income Hypothesis Based on a Reinterview Savings Survey*, in READINGS IN ECONOMIC STATISTICS AND ECONOMETRICS 253-83 (A. Zellner ed. 1968); Friedman, *Note on Nissán Liviatan's Paper*, in id. at 283-87; Liviatan, *A Reply*, in id. at 287-90.

16. Ehrlich 1975, supra note 14, at 398, 414.

17. Brief for the United States as Amicus Curiae at 35-38. In the summary of his argument, the Solicitor General described the Ehrlich study in these terms:

After performing a sophisticated regression analysis that analyzed the effects of many independent variables, [the most recent study of the deterrent efficacy of the death

the conclusions of the study as "completely unfounded."<sup>18</sup> If Ehrlich's study is reliable, it may be difficult to claim that the death penalty is "excessive and unnecessary" and therefore violates the Eighth Amendment. Because the technical merits of the Ehrlich study have thus become relevant to an important constitutional adjudication, the *Journal* is publishing what is essentially a statistical debate between Ehrlich and his critics.

In the first article, Messrs. Baldus and Cole defend Sellin and contend that his technique is better than Ehrlich's regression method for testing the deterrence hypothesis; in the second article, Messrs. Bowers and Pierce argue that Ehrlich's data are fundamentally inadequate for the method he uses and that no evidence of a deterrent effect is found when his method is correctly applied. Professor Ehrlich then responds with methodological and statistical arguments in support of his initial study and further elaborates on the basic issues underlying his research. In the next issue of the *Journal*, Professor Jon K. Peck<sup>19</sup> will comment on the debate between Ehrlich and his critics.

The difficulties a court faces in attempting to arbitrate an "abstruse statistical dispute" between parties to a litigation were forcefully noted by Judge J. Skelly Wright in *Hobson v. Hansen*,<sup>20</sup> a suit challenging different per-pupil expenditures among elementary schools in the District of Columbia. Judge Wright commented on "the added difficulties which beset the truth finding process when it is necessary to rely upon easily manipulated statistical analyses," and deplored the "overgrown garden of numbers and charts and jargon" which he suggested had obscured the basic issues in the suit.<sup>21</sup> He added:

The reports by the experts—one noted economist plus assistants for each side—are less helpful than they might have been for the simple reason that they do not begin from a common data base, disagree over crucial statistical assumptions, and reach different conclusions. Having hired their respective experts, the lawyers in this case had a basic responsibility, which they have not completely met, to put the hard core statistical demonstrations into language which serious and concerned laymen could, with effort, understand.<sup>22</sup>

The articles which follow attempt to meet this "basic responsibility" in the context of the statistical debate over the deterrent effect of capital punishment; to the extent it is not met, the Court must rely, as did Judge Wright, "upon burden of proof, and upon straightforward moral and constitutional arithmetic."<sup>23</sup>

penalty] concluded that, over the past several decades, each execution actually carried out deterred a significant number of murders. Other studies of the death penalty are infected by serious analytical flaws, and so do not provide support for a contrary conclusion.

*Id.* at 9.

18. Reply Brief for Petitioner, App. C at 4c. See Brief, *supra* at 19 n.31. Petitioner submitted two statistical critiques of the Ehrlich study, *id.* Apps. C & E.

19. Assistant Professor of Economics, Yale University.

20. 327 F. Supp. 844, 851 (D.D.C. 1971).

21. *Id.* at 852, 859.

22. *Id.* at 859.

23. *Id.*

## Statistical Evidence on the Deterrent Effect of Capital Punishment

These articles also illustrate the inherent vulnerability of complex statistical techniques to the adversary process. Any statistical analysis depends on a variety of explicit and implicit assumptions which can be challenged by opposing parties and on which experts may reasonably differ.<sup>24</sup> Since courts generally have no expertise to resolve statistical disputes, they will tend to ignore the evidence altogether once such a dispute arises.<sup>25</sup> The probative value of any study can be destroyed by raising a large number of technically complex objections, which, if not sufficient to disprove the results of the study, will at least undermine them to the point where the decisionmaker refuses to rely on them. This process tends toward Chief Justice Burger's characterization of the evidence on deterrence in *Furman*—an “empirical stalemate.”<sup>26</sup> The usefulness of statistical analyses to the courts may depend on the development of procedures to resolve the technical debates which seem inevitably to arise when such studies are put before them.<sup>27</sup>

24. See, e.g., J. JOHNSTON, *ECONOMETRIC METHODS* 121-23 (2d ed. 1972) (mathematical statement of assumptions needed for regression analysis).

25. Finkelstein has noted this tendency in administrative proceedings in which regression studies have been introduced. *Regression Models*, *supra* note 15, at 1444. The lack of success in the use of sophisticated statistical evidence in administrative proceedings necessarily raises doubts about the chances for its success in litigation before the courts, because agencies are likely to be both more able and more willing than courts to use this evidence. An agency has a staff which can develop the expertise necessary to construct an econometric model of a regulated industry. See, e.g., Khazzoom, *The FPC Staff's Econometric Model of Natural Gas Supply in the United States*, 2 BELL J. ECON. & M. SCI. 51 (1971). In addition, statistical evidence often bears directly on the predictions and policy decisions that the agency must make. For example, in a ratemaking proceeding, the agency must forecast the effect of the proposed change in rates on demand and supply in the regulated industry—a question which lends itself to econometric analysis. The relevance of the statistical evidence to regulatory decisionmaking may therefore lead agencies to encourage its use. See, e.g., Southern La. Area Rate Proceeding, 40 F.P.C. 530, 626 (1968), *modified*, 41 F.P.C. 301 (1969), *aff'd*, 428 F.2d 407 (5th Cir.), *cert. denied*, 400 U.S. 950 (1970), *quoted in Regression Models*, *supra* at 1458; Madison Gas & Elec. Co., 5 P.U.R.4th 28, 49 (1974).

26. 408 U.S. 238, 395 (1972) (Burger, C.J., dissenting).

27. Finkelstein, in *Regression Models*, *supra* note 15, at 1455-61, proposes that an administrative agency decide in advance on the data to be used in regression studies put before it in a given proceeding and that the agency require a party objecting to the statistical analysis presented to demonstrate the numerical significance of its objections or even to present a superior alternative analysis of the designated data. While possibly quite useful, these procedures are not likely to be sufficient to yield what their proponent describes as

a progression towards greater refinement and correctness in statistical methodology which will not only be apparent to the decisionmaker, but which may also achieve results meriting at least tacit agreement among experts.

*Id.* at 1466. Instead, each side, using high-speed computers, may be able to “mine” a limited sample of data for results which support its hypothesis. See *id.* at 1449 n.27; *Hobson v. Hansen*, 327 F. Supp. 844, 859 (D.D.C. 1971) (“the studies by both experts are tainted by a vice well known in the statistical trade—data shopping and scanning to reach a preconceived result”). Although its implications have not been fully discussed, this problem of “data-mining” has been recognized in economic journals. See, e.g., Jorgenson, Hunter & Nadiri, *The Predictive Performance of Econometric Models of Quarterly Investment Behavior*, 38 *ECONOMETRICA* 213-15 (1970).